

**INDIANA DEPARTMENT OF TRANSPORTATION  
MATERIALS AND TESTS DIVISION**

**DRYING HMA MIXTURES  
ITM No. 572-03T**

**1.0 SCOPE.**

- 1.1** This method of test covers the procedure for drying samples of HMA mixtures. Samples obtained in an oven bag require a moisture content determination. Samples, not requiring a moisture content determination will be dried to a constant weight (mass).
- 1.2** The values stated in either acceptable English or SI metric units are to be regarded separately as standard, as appropriate for a specification with which this ITM is used. Within the text, SI metric units are shown in parenthesis. The values stated in each system may not be exact equivalents; therefore each system shall be used independently of the other, without combining values in any way.
- 1.3** This ITM may involve hazardous materials, operations, and equipment. This ITM does not purport to address all of the safety problems associated with the ITMs use. The ITM user's responsibility is to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

**2.0 REFERENCES.**

**2.1 AASHTO Standards.**

M 231 Weighing Devices Used in the Testing of Materials

**2.2 ITM Standards**

580 Sampling HMA

**3.0 TERMINOLOGY. Terms and Abbreviations.** Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101.

**4.0 SIGNIFICANCE AND USE.** This ITM will be used to determine the moisture content of HMA.

**5.0 APPARATUS.**

- 5.1** Oven, capable of maintaining the temperature at  $221 \pm 9$  °F ( $105 \pm 5$  °C)
- 5.2** Electric skillet, with a thermostatic heat control capable of heating to 221 °F (105 °C)
- 5.3** Spatulas and trowels as needed

**5.4** Pans and containers as needed

**5.5** Balance, a Class G2, conforming to the requirements of AASHTO M 231

**6.0 SAMPLING.** Sampling will conform to the requirements of ITM 580.

**7.0 WEIGHING.** All measurements for one test will be done on the same balance.

## **8.0 PREPARATION OF SAMPLE.**

**8.1** For samples not requiring determination of the moisture content, separate the samples as uniformly as possible, using care not to fracture the mineral particles.

**8.2** The approximate minimum size of the sample will be in accordance with the following:

| Mixture Designation | Size of Sample | Minimum Weight (mass) of<br>Sample, g |
|---------------------|----------------|---------------------------------------|
| 4.75 mm             |                | 1000                                  |
| 9.5 mm              |                | 1500                                  |
| 12.5 mm             |                | 2000                                  |
| 19.0 mm, OG19.0 mm  |                | 3000                                  |
| 25.0 mm, OG25.0 mm  |                | 4000                                  |

## **9.0 PROCEDURES.**

### **9.1 PLATE SAMPLE.**

**9.1.1** Determine the weight (mass) of a round, bowl type, metal pan and a spatula at  $221 \pm 9^\circ\text{F}$  ( $105 \pm 5^\circ\text{C}$ ).

**9.1.2** Place the sample contained in the sealed oven bag (Note 1) in the tared metal pan with the spatula, and place in the oven at  $221 \pm 9^\circ\text{F}$  ( $105 \pm 5^\circ\text{C}$ ).

Note 1 - The weight (mass) of the oven bag will be determined and recorded on the bag prior to obtaining the sample. A constant weight (mass) of the bag may be used for a particular type of oven bag.

**9.1.3** Weigh the sample, bowl, and spatula after 1 h and record the weight (mass).

**9.1.4** Open the oven bag and place the sample, metal pan, and spatula in the oven.

**9.1.5** Weigh the sample, metal pan, and spatula at 15 minute intervals until constant weight (mass) (Note 2) is achieved. Stir the sample after each weighing if the sample has not reached constant weight (mass).

Note 2 - Constant weight (mass) is defined as the weight (mass) at which further drying at  $221 \pm 9^\circ\text{F}$  ( $105 \pm 5^\circ\text{C}$ ) does not alter the weight (mass) by more than 0.05 percent.

**9.2 TRUCK SAMPLE.**

- 9.2.1** Determine the weight (mass) of a round, bowl type, metal pan and a spatula at  $221 \pm 9$  °F ( $105 \pm 5$  °C).
- 9.2.2** Immediately place the sample contained in the sealed oven bag in the tared metal pan with the spatula, and weigh and record the weight (mass).
- 9.2.3** Open the bag and place the sample, metal pan, and spatula into the oven at  $221 \pm 9$  °F ( $105 \pm 5$  °C).
- 9.2.4** Weigh the sample, metal pan, and spatula at 15 minute intervals until a constant weight (mass) is achieved. Stir the sample after each weighing if the sample has not reached constant weight (mass).

**9.3 NO MOISTURE CONTENT DETERMINATION.**

- 9.3.1** Place the sample, sample container, and spatula in the oven at  $221 \pm 9$  °F ( $105 \pm 5$  °C). If a skillet is used, the sample shall be heated to approximately 221 °F (105 °C).
- 9.3.2** Weigh the sample, sample container or skillet, and spatula at 15 minute intervals until a constant weight (mass) is achieved. Stir the sample after each weighing if the sample has not reached constant weight (mass).

**10.0 CALCULATIONS.** The moisture content is calculated by the following formula:

$$\text{Moisture Content, \%} = \frac{W1 - W2}{W2} \times 100$$

Where:

W1 = original weight (mass) of sample, g

W2 = constant weight (mass) of sample, g

**11.0 REPORT.** The moisture content is reported to the nearest 0.01%.